

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Espinoza, et al.
Appl. No.	:	10/677,878
Filed	:	October 2, 2003
For	:	HEAT TREATED FISCHER- TROPSCHE CATALYST PARTICLES
Examiner	:	Johnson, Edward M.
Group Art Unit	:	1754

DECLARATION UNDER 37 CFR §1.132
OF DR. JAN PETRUS KAREL REYNHARDT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Dr. Jan Petrus Karel Reynhardt, declare as follows:

1. I am a technical specialist in the field of Fischer-Tropsch catalysis and I make this declaration in support of the above application.
2. I am familiar with the disclosure in U.S. Application No. 10/677,878 ("the present application"), and can confirm that the catalyst claimed in the present application is markedly different from those described in U.S. Pat. No. 4,618,597 ("the '597 Patent"). The important differences between the two catalyst systems are as follows.
3. The present application claims a self-supported precipitated α -Fe₂O₃ Fischer-Tropsch catalyst, whereas the '597 Patent is directed to an unsupported (self-supported) group IA or IIA metal and copper promoted iron-manganese spinel. The catalyst of the present application is a pure iron catalyst, as opposed to the catalyst of the '597 Patent which is a mixed metal catalyst (Fe-Mn).
4. The compositions and characteristics of a pure iron catalyst and an iron-manganese spinel are markedly different, and thus result in catalysts with vastly different product selectivities and activities. Spinel (e.g., iron-manganese spinel) usually perform

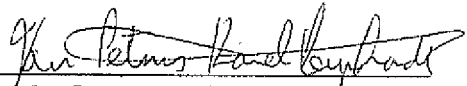
Appl. No. : 10/677,878
Filed : October 2, 2003

completely differently from pure phases (e.g., iron oxide) in that the reduction as well as activation procedures differ due to the presence of a second metal in a different oxidation state than the iron. The product selectivity differences are also evident in that when manganese is used in the catalyst, this leads lead to shorter chain olefins under low temperature Fischer-Tropsch (LTFT) conditions. The iron-manganese spinel catalyst is therefore designed and prepared for a completely different purpose as well as operating window than is the iron oxide catalyst, which is specifically tailored to produce long chain waxy products.

5. The preparation process described in the '597 Patent includes a heat treatment step (see col. 7, ln. 13). The temperatures used in this step are between 100-350°C, and the preferred temperature range is 150-200°C. The heat treatment therefore takes place at lower temperatures than claimed in the present application, which is preferably carried out at 360°C or higher, more preferably 380°C or higher. The calcination at 360°C+ of applicant's catalyst is performed to allow water to be removed from the surface of the catalyst, thereby promoting cross binding between the iron oxide particles increasing the strength of the catalytic particles. The preferred temperature is above 360°C for this cross binding process to occur in a reasonable amount of time.

6. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of any patent issued thereon.

Date: 17/12/2007

Signature: 
Dr. Jan Petrus Karel Reynhardt

4625631/umid/160607